

REPORT OF THE

INSTANT MESSAGING USING A WIRELESS INTERFACEField of the Invention

[0001] The present invention relates to facilitating communications between a telephony user and an on-line user, and in particular, relates to facilitating instant messaging between these users.

Background of the Invention

[0002] The rapid acceptance of the Internet has changed the way in which people communicate. A significant number of letters and telephone calls have been replaced with email messages. Although email is an effective communication medium, ongoing on-line communications are often hampered because of the extra steps necessary to view, reply, and send email messages. Further, email provides no way of knowing if the person with whom someone is communicating is on-line at that particular moment. With these deficiencies, instant messaging (IM) has gained great popularity over email to facilitate ongoing on-line communications.

[0003] Typically, IM allows users to form a list of people with whom they wish to communicate. This list is typically called a "buddy list," and most IM services allow users to communicate with anyone on their buddy list, assuming that the person is on-line at that given time. Generally, users will send an alert to those persons on their buddy list who are on-line prior to engaging in a conversation. Most IM services provide a small text window where two or more users can type messages that both users can instantly view. IM services not only allow users to send notes back and forth while on-line, they can also allow users to set up chat rooms

to communicate with groups of users, and to share links to web sites as well as images, audio, and the like.

[0004] With the increasing popularity of IM, as well as email, users continue to develop shortcuts for conveying words, phrases, and emotions to make these text-based communications more efficient and fluent. These shortcuts may include the use of acronyms, abbreviations, symbols, or combinations thereof. Given the difficulty in communicating emotion with written communications, a growing set of accepted symbols for emotions often punctuates these text-based messages. For example, a :) or :(can easily convey whether a sender of a message is happy or sad, respectively.

[0005] Given the wide acceptance of IM, there is a need to support IM between traditional on-line users and traditional land-based or wireless telephony users, who are restricted to using voice to send messages and to receiving audible messages. Further, there is a need to maintain the integrity of IM by conveying emotion and like characters with the messages between the on-line and telephony users.

Summary of the Invention

[0006] The present invention allows telephony users and on-line users to communicate with one another using an instant messaging (IM) service. The on-line IM user will provide and receive textual messages, wherein the telephony user will provide and receive corresponding audible messages. These messages may convey emotion using associated emotional indicia, such as emoticons, or other emotional indicia, including the use of capitalization, emphasis, and the like. Emotional indicia provided in the text messages from the on-line IM user are audibly conveyed to the telephony user.

[0009] Similarly, messages directed to the telephony user via a mobile terminal or the like and received by the IM server from the online IM user are forwarded to the IM proxy server. The IM proxy server will process the message to form a text-based message ready for conversion to an audio format. The processed message is sent to the audio browser, which converts the message to an audio format and delivers it to the mobile terminal. As such, the audio browser provides text-to-speech and speech-to-text conversion to facilitate communications between the IM proxy server and the mobile terminal. The IM proxy server translates text messages to and from other text messages in a manner consistent with instant messaging.

communications, a mobile switching center (MSC) 16 will typically communicate with base station 18. The base station 18 will support wireless communications with a mobile terminal 20, such as a mobile telephone or personal digital assistant (PDA).

[0027] In the packet-switched network 12, IM services are provided by IM server 22. Traditionally, the IM server 22 processes messages sent between users. For example, a text-based user B will use a computer 24 to generate and send instant messages for delivery to another user to the IM server 22. The IM server 22 will facilitate the delivery of the message to the other user for viewing. Similarly, messages directed to user B are sent to the IM server 22 and forwarded to user B's computer 24.

[0028] With the present invention, a telephony user A is allowed to participate in an IM session without negatively impacting or causing the need for modification in the IM functions provided by the IM server 22. Typically, an IM proxy server 26 acts as a liaison between the IM server 22 and the telephony user A. In essence, the IM server 22 will effectively treat the IM proxy server 26 as the telephony user A. The IM proxy server 26 interacts with an audio browser 28 to communicate with the telephony user A through telephony network 14 and act as a proxy for the IM server 22 on behalf of the telephony user A. As will be discussed in greater detail below, the audio browser 28 effectively translates speech to text for incoming messages from the telephony user A and translates text to speech for messages directed to the telephony user A.

[0029] The IM proxy server 26 interacts with the audio browser 28 to receive text converted from audio from the telephony user A and provide equivalent instant messages

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to the IM server 22 for delivery to the computer 24 of user B. Similarly, messages directed to the mobile terminal 20 and received by telephony user A from the computer 24 of user B are sent to the IM server 22 and forwarded to the IM proxy server 26. The IM proxy server 26 will process the message to form a text-based message ready for conversion to an audio format. The processed message is sent to the audio browser 28, which converts the message to an audio format and delivers it to the mobile terminal 20. As such, the audio browser 28 provides text-to-speech and speech-to-text conversion to facilitate communications between the IM proxy server 26 and the mobile terminal 20. The IM proxy server 26 translates text messages to and from other text messages in a manner consistent with instant messaging. Further detail is provided below.

[0030] Continuing with Figure 1, a short message service (SMS) gateway 30 or like system may be used to send alerts, instructions, or the like to the mobile terminal 20 outside of the IM services. These secondary messages may be used to simply alert the telephony user A that someone has joined the IM session or that a message is available for delivery to the mobile terminal 20. The SMS gateway 30 or like service is intended as a secondary message delivery medium to facilitate use of the IM capability of the present invention.

[0031] The telephony user A may establish various profiles, as described below, to guide and facilitate IM when using the mobile terminal 20. These profiles are preferably created and stored on a profile server 32 capable of communicating with the IM proxy server 26. Telephony user A may access the profile server 32 using a personal computer 34 or like computing device.

[0033] The present invention effectively blends the defined IM vocabulary and language with voice recognition technology to facilitate IM between audible and text-based communications. Accordingly, one embodiment of the present invention establishes a profile to govern communications between the telephony user A and the text-based user B. Preferably, a first conversion configuration is provided to convert messages from the telephony user A to an IM format for delivery to the on-line user B via the IM server 22. The IM proxy server 26 provides this service, wherein the audio browser 28 simply converts audible commands received from the user A to corresponding text, which is sent to the IM proxy server 26 for processing. Instant messages directed to the telephony user A from the on-line user B are directed to the IM proxy server 26 via the IM server 22 for conversion to a text format, which is readily converted

to audio upon being sent to the audio browser 28. As noted, the audio browser 28 will translate the audible message from the telephony user A. To facilitate these conversions, messages received from the telephony user A will take the form of a command, which includes a message meaning and defines one or more characteristics.

[0034] Notably, various characteristics may be sent with each message, pre-established for all messages, or a combination thereof. The table of Figure 2 defines various components corresponding to a message command and capable of being defined in a user profile. For example, the message command may include a relative volume for conveying the message, a type of personality, nationality, or ethnicity, an emotion, and the core meaning of the message. A particular message command may include any combination or any one of the characteristics in addition to the core meaning. As noted, these characteristics may be included in each command, or predefined to modify all messages in the session. Additional commands may be used to set these predefined characteristics for subsequent messages.

[0035] For example, the telephony user A may send a message to the text-based user B to say hello and associate a relative volume, with a sad emotional connotation. As such, the audible command may be stated as follows: "volume 'normal,' personality 'east coast,' emotion 'sadness,' meaning 'hi.'" The audio browser 28 will receive corresponding audio and convert the audio to text, which is sent to the IM proxy server 26. The IM proxy server 26 will recognize each characteristic and meaning and create a corresponding text message to send to user B, preferably using predefined profiles. Example profiles are provided in the tables of Figures 3 and 4.

14347HU 00000000

[0036] With the example command message, the meaning (hi) is associated with given emotion (sadness), which corresponds to phrase 21 in Figure 3. Based on the east coast style profile for the given personality, and the given volume, the corresponding phrase (21) is associated with an IM text phrase as illustrated in Figure 4. Thus, for an incoming message command for saying hello with normal volume, east coast personality, and a sadness emotion, the text message "Hi. Not doing well right now. :-(" is sent to user B via computer 24 through the IM server 22.

[0037] Notably, the relatively short message command resulted in a traditional IM message to the intended recipient. The particular meaning of the text was expanded based on the profile and was associated with a particular emotion and stated with a given personality. Normal capitalization indicated a normal volume. If a loud volume were requested, the following message would have been sent: ":O HI. NOT DOING WELL RIGHT NOW. :-(" The actual text uses all capital letters to indicate a loud volume. Further, the emoticon ":O" is used to further emphasize volume, wherein the ":-(" emoticon is used to convey sadness in traditional IM form. In addition to or in place of an emoticon conveying sadness, the profile could define all sadness-related text to be provided in blue. Similarly, anger could be conveyed in red. The emotional indicia associated with text may take on any form defined in the profile. This is preferably used in a consistent and reliable form to allow recipients of messages to recognize characteristics associated with the text.

[0038] Of further interest, the personality defined for a telephony user further translates or expands on the meaning of a message. For example, a Caribbean hello may

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take the form of "Hey mon" instead of the east coast "Hi." An aspect of the present invention allows users to communicate with varying styles while using consistent meanings and emotions. In one embodiment, the personality is set for an entire session, and the message commands spoken by the telephony user A will define a meaning and an emotion. Relative volume may be included in each command, but is preferably set at a given relative volume and changed only as desired during messaging for selected messages. Those skilled in the art will recognize the tremendous versatility and configurability of the profiles and characteristics. Further, additional characteristics may be added, and not all embodiments will require or use all of the characteristics described herein. For example, profiles may be set up using only meaning and emotion without regard to personality or volume.

[0039] The IM proxy server 26 includes or has access to the profiles via the profile server 32. The basic operation of the IM proxy server 26 is outlined in Figures 5 and 6. Figure 5 outlines the processing of messages directed to the text-based user B from the telephony user A. Initially, text-based messages are converted from audio commands received from the mobile terminal 20 via the audio browser 28 (step 100). From the command message itself, or as previously defined, the IM proxy server 26 may identify a relative volume (step 102), personality (step 104), emotion (step 106), and message meaning (step 108). Based on the identified characteristics and meaning of the message, a text-based IM message is created with the defined emotion indicia in a traditional IM format (step 110), and sent to the IM server 22 (step 112) for delivery to the on-line user B's computer 24.



VoiceXML is an XML document schema developed by the VoiceXML Forum, a group of organizations founded by AT&T, IBM, Lucent Technologies, and Motorola. VoiceXML facilitates web-generated interactions through audio, either pre-recorded or translated from text to speech, and through voice, using speech recognition. Additional

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[0044] As such, the audio browser 28 is the liaison between the telephone network 14 and the IM proxy server 26 of the packet-switched network 12, and operates according to a call dialog established by the markup language. The call dialog is preferably provided to the audio browser 28 in a VoiceXML web page created by the IM proxy server 26. The call dialog will preferably include the necessary information to interact with the telephony user A, and optionally, establish calls to and originated by the telephony user A, as well as report the status of the call or the caller's response.

[0045] Preferably, the IM proxy server 26 will generate the necessary call dialog in a VoiceXML page and provide the page to the audio browser 28. The audio browser 28 will execute the call dialog to control communications with the telephony user A via the mobile terminal 20, as well as deliver audio to the mobile terminal 20 corresponding to the instant messages, deliver messages to the IM proxy server 26, and receive audio making up the message commands from the telephony user A. Preferably, the call dialog provided in the form of a VoiceXML page to the audio browser 28 provides the

audio browser 28 with sufficient instructions to carry out its translational duties and control communications with the mobile terminal 20 to facilitate instant messaging as described herein.

[0046] Thus, the audio browser 28 provides text converted from audio to the IM proxy server 26 in the form of requests for web pages, and the responding web pages may include the text to convert and send to the mobile terminal 20 in an audible format. The VoiceXML pages will also include sufficient instructions to have the audio browser 28 convert incoming audio and request subsequent pages to facilitate ongoing IM. The call dialog provided in the VoiceXML pages may facilitate numerous iterations, instructions, and commands to effectively control the audio browser 28 and the connection with the mobile terminal 20.

[0047] An exemplary IM proxy server 26 is depicted in Figure 7. The IM proxy server 26 will preferably include a central processing unit (CPU) 36 having sufficient memory 38 to store the necessary software 40 to operate the server and store associated data. The CPU 36 is associated with a network interface 42 to facilitate packet-switched communications via the packet-switched network 12.

[0048] Figure 8 is a block representation of an audio browser 28, which will typically include a CPU 44 associated with memory 46 and the requisite software 48 to control operation. The CPU 44 is also associated with an IP network interface 50 for communicating with network devices, such as the IM server 22, the profile server 32, and the IM proxy server 26. A telephony network interface 52 is provided for interaction with the telephony network 14, and in particular, a local exchange or mobile switching center 16, to facilitate circuit-

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[0050] An overall communication flow diagram is outlined in general in Figures 9A, 9B, and 9C. The communication flow represents the telephony user A logging in to an IM service by initiating a call via the mobile terminal 20 and hanging up after login.

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Preferably, the audio browser 28, when called via the login number, will automatically answer the call, and via caller identification or by having telephony user A speak or otherwise enter login information, will effectively log user A into the IM proxy web server 26 by requesting a VoiceXML page configured to facilitate login (step 302). Based on the request, the IM proxy web server 26 will lookup or access user A's profile (step 304) and effect a login for telephony user A for an IM service at IM web server 22 (step 306). Preferably, the IM web server 22 will interact with the IM proxy web server 26 as if it were another computer logging in to a standard IM service.

[0052] Typically, the IM web server 22 will confirm the login by sending a confirmation message to the IM proxy web server (step 308), which will effectively reply to the original web page request by sending a web page providing the login confirmation in a VoiceXML format to the audio browser 28 (step 310). Assuming that on-line user B was not logged in to the IM service, the audio browser 28 may hang up or otherwise end the circuit-switched call between the mobile terminal 20 and the audio browser 28 (step 312). Those skilled in the art will recognize that the call may continue and facilitate IM as described below if an IM partner is immediately available for messaging.

[0053] Assume that on-line user B subsequently decides to check the IM service in which telephony user A routinely participates. As such, on-line user B will log in to the IM web server 22 from computer 24 (step 314). In traditional fashion, the IM web server 22 will confirm the log in to computer 24 (step 316) or otherwise ready itself to receive a message for delivery from user B. In such case, user B may send a message directed to telephony user A via the IM web server 22 (step 318).

[0054] The IM server 22, whether user B simply logged in or decided to send a message, may then send an alert to telephony user A via the IM proxy server 26 (step 320) as if the IM proxy server 26 was the device facilitating the messaging for telephony user A. In response, the IM proxy server 26 will alert telephony user A that on-line user B is logged in or that there is a message waiting for delivery. The IM proxy server 26 may alert telephony user A in any number of ways. For example, the IM proxy server 26 may cause a short message service (SMS) message to be sent to the mobile terminal 20 by sending a proper instruction to an SMS gateway 30 (step 322). The SMS gateway 30 will then forward the message using the SMS message directly to the mobile terminal 20 via the telephone network 14 (step 324). The mobile terminal 20 will then display the SMS message to telephony user A, and telephony user A can respond by dialing in to the proper number associated with the audio browser 28 (step 330).

[0055] Alternatively, the IM proxy server 26 may instruct the audio browser 28 to initiate a call to the mobile terminal 20 (step 326). The audio browser 28 will then dial the number associated with the mobile terminal 20 to establish a circuit-switched connection and provide

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[0058] The text-based phrases with the emotional indicia are sent to the IM server 22 as an IM message (step 340), which is forwarded to the on-line user B via computer 24 in traditional fashion (step 342). On-line user B may respond with a corresponding text message (step 344) by sending a message directed to telephony user A. The message is received by the IM web server 22 (step 346), and sent to the IM proxy web server 26 (step 348). The IM proxy web server 26 will translate the

[illegible]

[0060] The present invention provides for telephony users to participate in IM sessions in an effective manner without requiring reconfiguration of the IM service itself. Further, participants using telephony

[illegible]

[0062] Those skilled in the art will recognize improvements and modifications to the preferred embodiments of the present invention. All such improvements and modifications are considered within the scope of the concepts disclosed herein and the claims that follow.